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U.S. DEPT. OF AGRICULTURE

VOL. XV

FEBRUARY 1909

U. S. Department of Agriculture No. 5

The Agricultural Student



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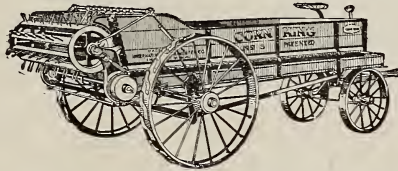
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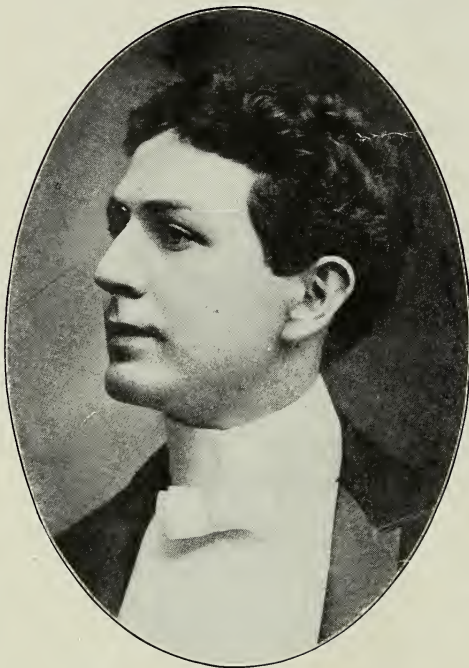
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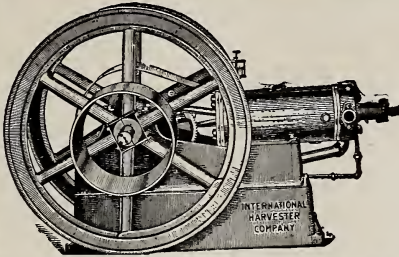
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CONTENTS.

February, 1909.

Cover—	
Scene on the Olentangy River.	
Frontispiece—"A Great Elm."	PAGE
What the Ohio State University is Doing for Forestry—	
Professor W. R. Lazenby.....	7
Cement and Concrete on the Farm—	
L. L. Scott, '09.....	9
Good Roads for Ohio—	
Professor A. G. McCall.....	12
The Dairy Farmer—	
J. H. Munger	13
Rape—	
L. M. Oyler, '10.....	15
Diseases of the Cantaloupe—	
H. A. Albyn	17
Live Stock Judging—	
S. R. Guard, '12.....	18
Insects and Fruit Growing—	
H. B. McClelland.....	20
Editorial Page	22
News Notes	23
The Tobbacco Trouble in Southern Ohio and Kentucky—	
H. E. Tweed	24

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THE AGRICULTURAL STUDENT.

VOL. XV.

OHIO STATE UNIVERSITY, COLUMBUS, FEBRUARY, 1909

No. 5

WHAT THE OHIO STATE UNIVERSITY IS DOING FOR FORESTRY

Professor William R. Lazenby

To the farmers, fruit growers and gardeners of Ohio the preservation, improvement and extension of our existing forests or woodlands is a subject of signal importance. Not to speak of the effect upon our climate, the reckless destruction of our timber trees, without any effort to make good the loss or restore the supply, is compelling those who come after us to pay many times the cost at which we might have grown them. There can be no reasonable doubt that this reckless improvidence is seriously affecting our climatic conditions.

While there is no evidence to show that the annual average precipitation in form of rain or snow has been materially changed, or that the distribution of the rain and snow throughout the year has been greatly modified, we do know that springs and wells are failing, that many small streams or brooklets are dry and that our larger streams and rivers are becoming more and more capricious in their flow.

We have record that floods are more common and that drouths are more frequent and more severe. If our rainfall is no less in total amount nor no less equitable in distribution, the water does not penetrate and remain in the soil as it did before our forests were so largely removed.

What must be done to make timber more plentiful and to render our climatic conditions more favorable?

Manifestly, we should in the first place preserve and improve our existing woodland. We should reclothe all rugged, broken land, all rocky crests and steep hillsides; in short, every acre that is not cultivated, or is cultivated at a continual loss, with valuable forest trees. It is the duty of every public-spirited citizen to incite and encourage the planting and managing of timber trees for one or more of the following purposes: (1.) Directly and specifically for timber. (2.) For shelter and protection. (3.) For ornamental and landscape effects. (4.) For some special economic product—like syrup or sugar, honey, nuts, etc.

For timber, all ravines and hillsides, every acre too rocky or too rough to be economically cultivated, as well as many odd corners of more level and richer lands, should be devoted to our most valuable forest trees. If such lands were judiciously and bounteously wooded once more and kept so, our floods would be less injurious, our springs, wells and streams less liable to failure; our winds would be less destructive; we should have more birds to delight us with their song and aid us in our oftentimes unsuccessful warfare

against destroying insects; we could grow cherries, peaches and other delicate fruits and vegetables with more certainty and receive a larger income from two-thirds of the land we now imperfectly utilize and cultivate than we actually do from the whole of it.

Statistics of recent date show that Ohio is not keeping the proud rank she once held in the yield of many farm and orchard products, yet no state has greater possibilities of production.

But these attributes of our state are material; they touch the commercial side of life. It is of far greater import that we should be able to justly claim that ours is a commonwealth of inviting, attractive, hospitable and happy homes.

To make the homes attractive they should be embowered and the roads leading thereto belted with stately, graceful trees.

No further argument is necessary to prove the unquestioned need of instruction in forestry, and forestry is fast becoming a well recognized profession in this country.

The people of the United States own nearly 150,000,000 acres of forest lands, the so-called national forests, and the need of trained men to care for these forests gives exceptional opportunities for graduates in forestry. In fact, two well-defined lines of work present themselves to the well-trained forester, namely, public service and private service.

The aim and purpose of the new Department of Forestry in the Ohio State University is to teach and train young men in forestry and to promote as far as possible the forestry interests or the proper use, improvement and extension of our forests and wood-

lands. The University will co-operate with the Forest Service of the United States, with the State Experiment Station and with the State Forestry Society.

The success of the new course in forestry can be well assured because the fundamental and accessory studies are so well provided by the existing departments of Mathematics, Drawing, Engineering, Chemistry, Physics, Botany, Entomology, Geology, Modern Languages, etc. These preparatory or basic studies are the very groundwork of a thorough education and training in forestry.

For what is termed field work, Central Ohio may not furnish as good opportunities as might be desired, but the convenient trolley car systems will take the student, at moderate cost, to a great variety of interesting and instructive forest conditions.

I should like to impress one fact upon the mind of the prospective student of forestry, and that is that the profession demands some sacrifices and includes some hardships.

One would better not start upon a course in forestry unless he is willing to live close to nature, enjoys the outdoor life and does not unduly covet the conveniences and luxuries of the city.

Another thing should not be forgotten: The successful completion of a good course in forestry does not make an expert. It simply lays the foundation and points out the way. Mastership comes only with experience.

CEMENT AND CONCRETE ON THE FARM

Leonard L. Scott, '09

Since the colonization of this country by our Puritan forefathers there has been a drain upon our timber resources which has increased from generation to generation as civilization progressed, until today the question of preserving our forests so that future generations will not be deprived of timber, has become quite serious and occupies a place as one of the prominent national problems.

It is because of this decrease in our timber supply and the resulting increase in the price of lumber that there has arisen a demand for a new building material.

Since lumber has always been the chief building material of the farmer, this scarcity has probably been most keenly felt by him, and naturally he has sought a substitute which would be economical to use and which would possess strength and durability together with neatness of finish. Some form of cement seems to fill all requirements most perfectly, and so we find it coming into quite general use on the farm, not alone for foundation work, but for building construction, fence posts, etc.

There are really three different kinds of hydraulic cement in use: Puzzolan, or slag cement, natural cement and Portland cement.

That the use of cement is not of recent origin is shown by the cement and concrete structures of the Romans, many of which have lasted until the present day. Their cement was simply a mixture of volcanic scoriæ with slaked lime, which possessed the quality of hardening under water.

The term "Portland cement" originated in England in 1756 in connec-

tion with the building of the Eddystone lighthouse when it was discovered that certain combinations of clay and lime gave a mixture which would harden under water, and from that time to this the manufacture of Portland cement has been increasing.

Natural cement, as the term implies, is found as a rock in nature in about the right proportions, although it is much less strong than the manufactured articles. The materials of Portland cement are carbonate of lime and clay. The carbonate of lime may be chalk, such as is secured from the chalk hills of England, or limestone, or limestone containing clay, which is called cement rock, rock or marl. In some sections of this country, particularly in Indiana and Michigan, fresh water deposits are found in the form of white paste, which makes an exceedingly good cement material.

Where cement rock is found, the material is quarried, ground to a fine powder and then burned in a kiln until all the carbonic acid is driven off, when the resultant pebbles are again ground to an impalpable powder and mixed with 1 to 2 per cent of gypsum to prevent quick setting. Portland cements are burned at a much higher temperature than natural ones, and as a result are much stronger, although the latter are quite extensively used, especially in places where they will be subject to limited strains.

In the care of cement before it is used, much caution is required or it may lose a great deal of its value. In storing cement it should be kept free of the ground by placing it on a low platform of some kind, and it should always be protected from an excessive

amount of moisture in the air, as it rapidly absorbs this and soon becomes hard and valueless. No attempt should be made to pulverize cement which has hardened before using, even though it can be done, for cement is useless once it has set.

In mixing cement or concrete everything should be arranged as conveniently as possible so that once the work is started it can be carried on without any serious delays. Cement mortar is an intimate mixture of sand and cement with enough water to produce a plastic mass. The proportions of Portland cement are three parts sand to one of cement, and for natural cement about two parts sand to one of cement. The mixture should be made plastic enough so that the cement will flow and fill all the voids between the grains of sand. A "lean" mixture is one having only a small portion of cement, while a "rich" mixture is one with a large proportion of cement.

"Neat" cement is pure cement without sand, while "aggregate" is a term used to designate the coarse materials entering into concrete. "Grout" is a term applied to mortar mixed with an excess of water so that it has about the consistency of cream, and is largely used to fill voids in masonry, although its extended use, especially if strength is desired, is not recommended.

In making concrete, there are several materials which can be used, although all are not equally well adapted. Perhaps the most common material is gravel, and if this is used, it should be quite free of clay and other impurities so that the mass will adhere well together, and the pebbles should be of varying sizes so that all the voids will be properly filled. If crushed stone is used, the same pre-

cautions should be observed. This material is perhaps better suited than gravel on account of its angular shape, which will make a much stronger mass. Broken pieces of bricks are also frequently used, but they seem to be too soft and absorb too much water. If cinders are used, as in floor construction, where it is desired to have porosity and a substance into which nails can be driven, the concrete must be mixed quite soft, so as to require but little tamping and to avoid crushing the cinders.

If reinforcing material of any kind is to be used, the mixture should be made rather wet so as to insure the molds being well filled. Again, in the manufacture of such articles as fence posts, building blocks, etc., it is desirable to have the cement quick-setting so as to avoid the use of so many molds. This makes a weaker cement than the slow-setting ones, but the strength is usually sufficient for all the stresses to which the material will be subjected.

In coloring cements, the best results are obtained by the use of mineral pigments. The coloring matter, in proportions depending upon the desired shade, should be mixed with the dry cement before making the mortar.

The following pigments will give about all the colors desired:

- Lampblack, for gray or black.
- Yellow ochre, for yellow or buff.
- Umber, for brown.
- Venetian, for red.
- Ultramarine, for olive.

One of the most common uses to which concrete has been put is in the construction of sidewalks, where it has met with marked success for a number of years. In making a sidewalk the ground is excavated to sub-grade and well consolidated to prepare for

the sub-foundation of gravel, stone or cinders, which is well tamped to secure a good base for the main foundation of concrete. This on good, solid ground need not be over 4-6 inches thick, and about a 1-3-6 mixture. When the foundation has become well settled, but not set, the top-dressing, or wearing surface, is applied, consisting of a mixture of one part cement to two parts sand, and rubbed down to a smooth surface.

Where concrete is used for the cellar or basement floor in dwellings, as a rule less strength is required than out of doors, unless there is a considerable water pressure to resist from below. The sub-foundation should be well drained and the foundation made from three to five inches thick from a 1-3-6 mixture.

In constructing stable floors and driveways, the same directions should be followed except that the foundation should be probably six inches thick with at least one inch of surfacing, and this latter should be roughened to prevent animals slipping, by dividing into small squares. This also adds to the appearance of the completed work.

Concrete finds still other uses on the farm in the construction of steps, retaining walls, water tanks, silos, foundations and fence posts. Each one of these uses requires a little different treatment from the others, and quite explicit directions as to the construction of most of these articles are given in bulletins published either by the Government or by the Association of Portland Cement Manufacturers.

Since fence post material is becoming quite scarce upon our farms, it might be well to say a few words concerning their manufacture from concrete. In the first place, a concrete fence post, to be suitable, must be obtained at a reasonable cost. It must be of sufficient strength to meet the demands of general farm use, and it must be able to successfully withstand the effects of water, frost and fire; and the reinforced concrete post seems to meet these demands quite well.

The reinforcements for concrete posts should never be of wood, for if on the surface it will decay and be valueless, and if on the inside it may absorb moisture, expand and crack the post. The reinforcement should always be made of steel bars or wire. This material will last indefinitely and give no trouble. The concrete for the posts should be about a 1-2½-5 mixture, the "aggregate" being of material less than three-fourths of an inch large. The tapering post is most economical and molds can be made accordingly, preferably six in a set, so that posts can be made more rapidly. The material should be well tamped into the molds so as to fill all corners, and before the cement sets staples should be inserted far fastenings for the strands of wire. If desired, the corners may be beveled off while the cement is soft, and thus make a neater looking post. Usual dimensions are 6x6 inches at the bottom, 6x3 inches at the top and 7 feet long. However, dimensions can be regulated to suit the individual.

GOOD ROADS FOR OHIO*Prof. A. G. McCall*

Ohio, in common with many other states, is now engaged in a vigorous campaign for better roads. The steam roads and electric lines have largely solved the transportation problems with respect to long distance hauls, but the problem is far from being solved for the agricultural interests of the state, so long as it costs as much to haul a ton of corn or wheat to the railroad station as it does to carry it 150 miles over the railroad.

Reliable statistics collected about two years ago show that the average length of haul in Ohio for corn, wheat, oats, hay and potatoes is 6.4 miles, and that the average cost is 6.6 cents per hundred pounds, or \$1.32 per ton. The cost of transportation on railroads

varies from one-half of one cent to one cent per ton per mile, according to the bulk of the material. In many sections of the state the roads are in such bad condition the greater part of the year that it costs the farmer more to haul his corn from his crib to the elevator than it costs the grain dealer to ship the same quantity to Baltimore or to Chicago.

In Ohio in 1908 there was produced in round numbers about 22,700,000,000 pounds of corn, wheat, oats, potatoes and hay. At six cents per hundred it would have cost the farmers of Ohio \$13,620,000 to move these five crops to the shipping station. Of course a considerable quantity of this material is consumed at home, but this amount



consumed at home is more than offset by the live stock, other crops and timber that is transported over our roads. It is fair to say, therefore, that our roads exact a toll of at least \$13,000,000 annually from the farms of Ohio. Good stone and gravel roads that have already been constructed prove conclusively that a very large part of this sum could be saved by a systematic development of our highways. Good roads are a great boon to a community, but bad roads impose a great tax and hinder upon the locality in which they are found. Leaving out of consideration the dollars and cents side of the road improvement question, there are other matters no less important. Effective rural delivery, the consolidation of our rural schools, social intercourse and other important factors in the development of rural life are intimately bound up in the good roads development.

It must be admitted by even the most sanguine advocates of good roads that it will require a long time to build sufficient macadamized roads to materially affect our conditions.

With a liberal appropriation from the state, counties in which good stone and gravel are abundant should be able to increase their mileage of good stone road quite rapidly. But there

are many localities in which the great cost of macadamized roads is practically prohibitive. These counties are remote from the supply of good road building material, which greatly increases the cost, and in many cases their tax duplicate is not sufficient to support a tax nor to warrant the issue of bonds. It follows, therefore, that whatever may be the outcome of the present movement for good roads, the fact remains that for many years to come the great percentage of our road mileage in many localities must be of earth or clay. It is important that in the campaign for road construction we do not lose sight of the importance of maintenance and repair. Ignorance of the fundamental principles of road repair and maintenance is responsible for the bad condition of the roads in most localities. Good drainage and the persistent use of a drag will do a very great deal toward keeping a dirt road in fair condition throughout the year. Every reader of the Student should interest himself in the good roads movement, not only with respect to the construction of good stone roads, but also to the extent of seeing that the roads at home are in the hands of competent men, and that repairs are made promptly and with intelligence.

THE DAIRY FARMER

J. H. Munger

What looks more enterprising on the farm than fine live stock? What is more essential for the greatest pleasure and prosperity?

To those who are interested in dairying, nothing is so pleasant to the owner as to look at his herd, knowing that every animal is delivering to him a profit.

This is the essential thing to know before an animal is given a permanent place in the herd.

There are many lines of dairying which may be taken up, and the business must be studied from all points before a decision is made. The kind of market is probably the most important factor to be

considered. Shipping whole milk requires the least labor of any kind of dairying and is very profitable if a suitable market can be had.

After the kind of dairying has been decided upon comes the selection of the breed, if pure bred animals are desired. If not, then the selection of individuals is most important. While the herd is being selected and improved there are other things which are very important to facilitate the work to be done which must be thought over and decided upon.

In the first place, let us consider the silo, which is necessary, not only in dairy farming, but in other stock farming. The silo is at present coming into use as rapidly as any other improvement of late years, and rightly so, too. It gives us that feed during the winter which largely takes the place of grass. The cow will keep up a more uniform flow of milk in the winter when fed silage than she will in summer when the extremely hot days and the flies, which cannot always be warded off, work havoc with the milk flow. Silage is not only valuable in keeping the cow in good condition, but more of the corn will be utilized. More profit will be gotten from your field of corn used in this way than in any other way you can handle it. The corn is handled but once and is always under cover and ready for the cows that are so fond of it. The corn crop is off the ground early, leaving plenty of time for preparing the seed bed and seeding to wheat, if that is desired.

The gasoline engine is a great saver of work on the dairy farm. There are

many things it can do, pump water, grind feed, cut roughage and in some cases milk the cows. Water can be forced to any part of the buildings. Feed can be ground in a short time at home, saving a disagreeable drive to mill and hauling back and forth over rough ground. The cows often eat cut roughage better than they do the uncut. The gasoline engine is without doubt an excellent investment on the dairy farm.

Having all these things, there is still a very important improvement to be made, and that is a covered barnyard. This makes a place for the cows to eat their roughage, or most of it, at least; it saves the drudgery of cleaning stables and the cows are not tied up day in and day out. They may eat a little more for being out, but they will be healthier and the milk that they give will be purer. The cows can be kept cleaner at less expense when running in a covered yard than when stabled.

The covered barnyard gives an excellent opportunity for working all straw produced on the farm into good manure. The manure won't be leached out by the rains, either. The contentment of a herd of cows in a place like this is a sure indication to the owner that his cows are storing up milk for him and that the investment is a good one.

Labor is an important item in dairying, but with all the improvements suggested the labor bill can be cut to the minimum, and dairying after all will not be found to be the drudgery that lots of people think it.

RAPE

L. M. Oyster, '10

Rape is much like the Swedish turnip in appearance, but the root is more like that of cabbage. The leaves are large, smooth, spreading, variously notched and divided, and covered with a fine meal, as the cabbage is. The flowers are bright yellow, nearly one-half inch in diameter. The seeds are produced in pods, usually two inches or more long. They are black and globular, resembling the seed of the cabbage and turnip, but somewhat larger than these.

Rape is either annual or biennial. The annual varieties (summer rape) are grown chiefly for the seed. The biennial varieties (winter rape) are used largely for forage. Of the important winter varieties in American agriculture, the Dwarf Essex and the Victoria are the most popular.

Rape has several uses. The seed yields oil, which is used for lubricating and lighting purposes. The compressed rape seed cake is used as a food for stock and as a fertilizer. The chief use in this country is for forage, being used chiefly for soiling and summer and autumn pasture.

Rape, like the turnip, is a native of Northern Europe; hence, it is best adapted to rather cool, moist climates, such as prevail in portions of Canada and the northern United States. It can, however, be successfully grown as a forage crop in many of the warmer and drier sections. In the Northern States the biennial rape will not survive the winter, hence, does not produce seed.

For its best development rape requires a rich, moist loamy soil, and will usually do well on any but light sandy soils and stiff clays, such soils

being usually deficient in vegetable matter.

Rape draws quite heavily on the nitrogen and mineral constituents of the soil, and hence should be used in rotation with crops that feed largely on other elements of plant food. On account of its power to utilize fertilizer and barnyard manure, rape is an excellent plant to grow upon land recently treated with manure.

When rape is grown as the primary crop of the season, the land should be prepared by deep and thorough plowing, preferably early in the preceding autumn. The land should be well pulverized by harrowing before the seed is sown. Whatever treatment the land is given in preparation for this crop, it should be such as to afford a deep, mellow seed bed, as free as possible from noxious weeds. Under favorable conditions the rape plant grows very rapidly and produces a crisp and tender foliage, which is much relished.

Seeding throughout the Northern States may take place from the first week in May to the middle of July, according to the season and locality. Usually two or three pounds of seed per acre will be sufficient, and it will never be necessary to use more than five pounds per acre. The seed should be planted in drills far enough apart to allow cultivation.

With favorable soil and climatic conditions, good crops of rape may be obtained from broadcast seeding, but whenever there is any danger of the surface soil becoming very dry during the time the seed is germinating, or when land is at all foul, drilling will give much better results, as this method of seeding



A PLEASANT HOME FOR ANYBODY

allows cultivation of the rape. Cultivation increases the yield, conserves moisture and keeps down the weeds, and if the crop is to be pastured there is much less waste when the plants are in rows, as the animals are inclined to follow between the rows rather than crossing them and trampling the plants.

Rape resists drought fairly well, but in regions subject to a summer drought the sowing should take place early enough to get the plants well started before this period, or it should be delayed until after the drought. Where rape is depended upon as a chief crop, it is advisable to make several successive growings. If the seed has been drilled the crop should receive three or four cultivations during its early growth. This should commence as soon as the plants are large enough and be continued until

the plants have spread so much that they will shade the ground well.

Rape is usually ready for use in about eight or ten weeks from the date of seeding. The general practice is to use it as a soiling crop or as pasture for sheep, swine or cattle.

The chief use of rape is for pasture, especially for hogs and sheep. It cannot be recommended for curing as a dry fodder or for silage, as it is so succulent that it cures with difficulty, and it cannot be compared to corn for silage.

Rape has a high feeding value. It makes an excellent feed for fattening sheep and swine and for producing an abundant flow of milk in milch cows. Rape can be used to good advantage as a part of the ration for animals that are being fed in pens for market or for the show ring. It is also a valuable food for

young lambs at weaning time. As rape will endure quite severe cold weather, it can be used to fatten stock for the holiday markets at a great advantage over less succulent food.

Aside from its value as forage, rape is an excellent crop to grow on fields that are foul with weeds. An excellent treatment for a foul field is to plow thoroughly in late summer and early autumn and seed to rye or some other forage crop to be pastured off during the fall, winter or

early spring. When the crop has been pastured sufficiently and before the weeds have produced seed, plow again, plant rape in drills and give thorough cultivation. There are few weeds that will survive such treatment and the land will have given profitable returns in forage in the meantime, the rape being valuable not only as a forage, but in destroying one of the farmer's enemies—the weeds.

DISEASES OF THE CANTALOUPE

Herbert A. Albyn

Diseases of the cantaloupe may be divided into two classes, diseases from parasitic fungi and the various types of constitutional diseases which are generally caused by a bacterium.

The diseases caused by parasitic fungi are usually designated by distinct, irregular yellow or greenish marks or spots upon the leaves or stem, usually the old leaves first, and the gradual weakening to death of the part. It is transferred from one plant to another by spores that are blown about by the wind or carried by insects. These, when on the leaves of the host plant, germinate and send out a root-like thread that enters through the pores into the tissue of the leaf. When the fungus has reached a certain stage in its development it sends out organs on the under side of the leaf that develop the spores, which have the downy appearance, and is known as "downy mildew." Knowing that the disease starts from the upper side of the leaf, here is where the remedy or preventive must be applied, and before the disease makes its appearance, for neglecting to spray until the downy mildew has made its appearance, which

is from July 20 to August 1, means failure to control the disease, because, after the mycelium threads of the fungus once get started into the tissue of the plant, no known remedy will act upon it. The remedy most commonly used and with the best results is Bordeaux Mixture of the formula four pounds copper sulphate, four pounds of lime and fifty gallons of water, and continued every two weeks as long as the vines are giving fruit.

The bacterial diseases affect the whole plant, or at least a large portion of it; the seat of the disease is most common in the vine, cutting off the food supply from the foliage. The one of these diseases I will speak of mainly is one that I had to contend with the past season in the University gardens. The disease made its first appearance when the vines were about two feet long and at various places over the field, the vines wilting as though they had been cut off. Bordeaux was at once applied with little, if any, effect. Seeing that something else must be done or the entire field would be lost, the following experiment was made: Three plots of four hills, each containing four plants as nearly alike as possible.

were staked off. Plot one was sprayed with Bordeaux Mixture, plot two with copper sulphate of the formula five pounds to fifty gallons of water; plot three was left unsprayed. All plots received the same cultivation. Spraying was continued every two weeks for the entire season with the following results: At the end of four weeks, or at the time of the second spraying, plot one contained nine plants, four in the first hill, three in the second, two in the third and none in the fourth. Plot two contained fifteen plants, only one dead. Plot three contained seven plants, these being distributed between two hills. At the time of the third spraying, plot one had seven plants, plot two fifteen and plot three two. In applying the Bordeaux Mixture the vines were completely covered, while in the case of the copper sulphate the crown and roots were soaked and none applied to the leaves. Upon close examination it was determined that

the disease attacks the plant either from the roots or at the crown near the ground, as the leaves nearest the roots wilt first and the disease quickly follows out the stem to the tip. Upon cutting the vine, the hollow was filled with a sap of a different color from that of the healthy plants, which later I learned was due to a color producing bacteria that caused the disease, specimens of this was mounted and pronounced by Dr. Morrey to be bacillus. The course of inoculation must be by insects that puncture the vine or by some thing that works on the roots. The Copper Sulphate will not control the disease after it has once attacked the plant, but will prevent it if applied in due season and in the proper way. Another preventive would be to burn all old vines or carry them off the ground and keep plants free from insects.

Further investigation will be made along this line the coming season.

LIVE STOCK JUDGING

S. R. Guard, '12

Of recent years live stock judging has come to be regarded as absolutely essential to a useful and practical knowledge of animal husbandry. A successful breeder or improver of any class of live stock must needs be a good judge. The breeder must know what a good animal is, so that he may have a goal towards which he can strive. Many breeders fail to breed good animals only because they don't know what good animals are. Then, the farmer who raises or feeds animals for the market must be a judge of live stock so that he may know the merits (and shortcomings) of his own product. Knowing this, he is able to get their full worth and so realize the maxi-

mum profits. Needless to say, the buyer, or the butcher, must be, and generally is, an expert judge in order that he may not pay more for any animal than it is really worth. How, then, shall we go about it to become a good judge? This we shall endeavor to ascertain.

The first essential characteristic of a good live stock judge is his interest in the work. There must be about him an inherent love for those creatures of God's making, which stand so ready at all times to cater to his many needs. It is impossible for a man who does not love and feel a keen interest in those brute subjects which he is learning to judge, to ever become an expert in that line.

A prime requisite of a good judge is a standard with which he is to compare what he is judging. This ideal may be, and for the most part is, a mental image, but nevertheless it must be a correct one in all points. A living animal exactly representative of this standard would be a perfect one, and it is extremely doubtful if a faultless animal has ever been produced. It may take a great deal of experience and study before the student acquires this ideal or standard in his mind's eye, but by perservance and the comparison of the perfect parts of many individuals it will be acquired. He may have to change his ideal many times, but he must have one.

In establishing an ideal we must consider the use to which the animal is to be put. In setting up a standard, utility is the first great requisite. Nothing must be admitted which detracts from it. In considering the utility we must cater to two sides, the producer and the consumer, the farmer or the breeder and the butcher or the buyer. The ideal must be well developed in those parts which make it thrifty and healthy in the feed-lot and stable, as well as in those which produce the highest priced cuts or make it the most powerful in drawing a load. Neither side can be ignored for the sake of the other. The happy medium must be found and maintained. This will be our standard.

In helping us to learn what these ideals are and to fix them in our minds the score card system has come into almost universal use. The score card is an educator of great advantage to the student, but of course the leading judge in the show ring would not use it. As he goes into the ring he carries a well defined mental conception of his ideal and is able at once to detect those qualities which are objectionable. So after all, this virtually amounts to the use of the score

card without the objectionable features of that system. The scare card is merely a scheme for fixing in our minds that which may constitute perfection in the various points of an animal. It also teaches us the relative value of the various points, and we learn that a bad shank does not detract so much from the value of a beef animal as does a bad loin. We learn the relative importance of form, conditions and quality to the other points and so are able to give an intelligent reason for our placings. By actually using this system and seeing on the living animal what corresponds to a certain point on our score card, and wherein it lacks in measuring up to the standard as it is set down, we grow familiar with what a perfect animal should be like. As we acquire an understanding of what constitutes genuine excellence, we do not need to use the score card, because we carry the substance of it in our mind. The analytical method of resolving our problems into the various principles and formulas which control them is an intelligent method of study and investigation, and is as applicable and useful to agriculture as to any of the sciences.

An expert judge of live stock has two faculties especially well developed—observation and judgment. Observation in this case consists in the use of the eye and the hand. Knowing what to look for, the eye must see it quickly and accurately. We can only gain this faculty by diligent practice. The observation of a point is the basis for a conclusion, so a mistake in one means a mistake in the other. We must learn to see things as they really are and to detect any faults or deviation from our ideal. Our ideal, having been based on the best qualities and characteristics of animal life, is the guide for whatever conclusion we draw our observation. This conclusion is our judg-

ment. Both the judgment and the observation are trained at the same time and by the same means, experience. The careful eye, the gentle touch of an experienced hand, and the accurate judgment are obtained only through practice and experience.

Live stock judging is essentially a comparative study. We are constantly comparing our subject with our standard. In a ring of animals we compare one animal with another and all of them with the correct ideal, and so select the best one. Comparison (or contrast) is in itself quite an art, and it, also, is only perfected by practice. We may add here that it is legitimate only to compare animals of the same general type, i. e., we can't compare a dairy animal with a beef animal, nor a lard hog with a bacon hog. Each type has its own standard and must be judged accordingly.

As we, of today, take up the subject of judging live stock, we are struck with one thing most forcibly, gratitude to those who have gone before and paved the way so that we could follow and attain the same goal with but a fraction of the exertion they had to put forth. We refer to those authors who have so ably written various treatises on the various phases of judging. Our ideals are formed and our methods determined by reading these, and, having the advantage of these, it is so much easier for us to acquire the keen eye and the correct judgment. It is but the dawn! The future will see better animals, better treatises, better farmers and better judges (perhaps partly made up of some who are today in the embryonic stage), as a result of the increasing interest in live stock judging.

INSECTS AND FRUIT GROWING

H. B. McClelland

For many years prior to a recent date our Eastern orchards were comparatively free from serious damage by scale insects, or "bark lice," as they are indifferently termed. Barring the old and well-known oyster shell bark louse of the apple, orchardists were not often compelled to fight any insects of this group, and even this species, abundant and widespread as it is, had come to be considered, as it still is, a rather unimportant factor in apple raising and seldom necessitating treatment in other wise healthy and vigorous orchards.

Within the past few years, however, conditions as regards scale insects in general have changed. The San Jose,

or pernicious scale of the Pacific coast, has come East and threatens great damage. The new peach scale has made its way across to Florida from the West Indies, and is now destroying trees as far north as the District of Columbia. The peach lecanium has apparently increased and spread and has caused considerable alarm in several large nurseries. The so-called walnut scale has transferred its attentions to the pear and peach in the South and Southwest, and the greedy scale, although found until recently only on the Pacific coast and in the far Southwest, brings great loss to the fruit growers in those regions, and has recently made its appearance in Mississippi and

Texas. In no country in the world do insects impose a heavier tax on farm and orchard products than in the United States. Among the crops which suffer most heavily are the orchard and small fruits. They have suffered both directly, and because of the expensive methods of treatment necessary to prevent still greater losses.

Take for example the apple, which is one of our most common fruits in this part of the country. There are several

hundred insects which feed on the roots, trunk, foliage and fruit of the apple. The most important of these pests are the woolly ophir, which injures the roots; the trunk and the limb borers, the leaf worms, canker worms and tent caterpillars and the various scale insect pests, including the San Jose scale.

Those insects which affect the fruit are the codling moth, the curculio and the apple maggot.

(Concluded on page 25.)



EXAMPLES OF NEGLIGENCE THAT MEAN LOSS TO THE FARMER

THE AGRICULTURAL STUDENT

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FEBRUARY

EDITORIALS

The Agricultural Society of the College of Agriculture

If there is any society in the Agricultural College that should be well attended that society is the Agricultural Society. It is so cosmopolitan. Every agricultural student may belong. The meeting of this society is the only place outside the class room where agricultural students may assemble. Here they may talk over the live topics of the day and discuss them among themselves. The professors, too, should attend and have a place in the discussions.

The very best speakers in the agricultural world are available and should be brought here.

College life does not consist in simply going to class and getting any information that may be handed out. A great big half of what you get out of college consists in the experience you get in coming into contact with men; in putting your ideas up against those of other people. The wider your acquaintance in college, the more efficient you will be when you leave college. You will have confidence in yourself. You will have learn-

ed that all men are human, and you will be willing to take your chance with any of them.

You can gain some of these things in the agricultural meetings. Opportunities of this kind do not come often in a man's life and he who takes advantage of them is the man who will make a success.

As this paper goes out of our hands and into the printers', the Dairymen of the State are in the midst of their annual meeting. They are having a real, live, vigorous meeting. The attendance is very good, the speakers so far fine, the exhibit of dairy machinery large and the premium list for dairy products is very generous.

Many of our readers do not see the American Sheep Breeder, and we are going to take the liberty to copy from the cover page of their Xmas issue the following verses which seem to us very beautiful:

CHRYSTEMESSE BELLS

Two sorrie thynges there be—

Aye three;

A neste from which ye fledglings have
been taken,

A lambe forsaken,

A redde leafe from ye wilde rose rudely
shaken.

Of glad thynges there be more—

Aye, four;

A lark above ye old neste blithely sing-
ing,

A wilde rose clinging

In safety to a rock, a shepherd bringing
A lambe found in his arms, and

Chrystemesse bells a-ringing.

NEWS NOTES

The Ohio Agricultural Student Union Banquet, held at Beggs' banquet hall on January 13, the week when many agricultural meetings were held in Columbus, was a very enjoyable affair. There was a good attendance, although not so large as it should have been. The program of toasts was as follows: J. F. Cunningham, of the Ohio Farmer, acting as toastmaster; "As You Like It," C. W. Burket; "Scissors and Paste," C. E. Snyder; "The Gist of the Story is This," Prof. A. G. McCall; "The Naughty Naughts," Prof. V. H. Davis; "Ye Editor," H. W. Collingwood. T. D. Harmon also gave a short talk. Officers were elected as follows for the coming year: President, V. H. Davis, Columbus; Vice President, J. H. Dunlap, Williamsport; Secretary Treasurer, Prof. R. T. Shields, Columbus; Member Committee on College Affairs, C. W. Burkett, New York; Committee on Necrology, Prof. J. S. Hine and C. E. Snyder, Columbus, and Mr. Lisles; Newspaper Representative, M. E. Wampler, Columbus.

The fifth annual meeting of the Ohio Live Stock Association will be held at the University in the judging pavilion, on Tuesday and Wednesday, February 16 and 17. Programs will be mailed to all requesting them. There will be some judging contests, some demonstrations of methods of fitting stock for show, and a conference on the subject of tuberculosis in cattle. Other subjects of interest will also be on the program.

C. S. Plum, O. S. U.,
Secretary.

The Alpha Gamma Rho Fraternity held its annual alumni banquet on January 14.

The Shorthorn bull, Ohio Czar, used for two years in the University herd, was sold to a party in West Virginia. In his place the Department has secured the roan bull, Auverne Ensign, from Mr. Byron Hawley, of Woodstock. Auverne Ensign is a son of Julia Everitt, the dam of Ohio's Crown, the champion Shorthorn steer at the 1907 International Exposition, exhibited by the University.

A class of about twenty-five students in the short winter course is receiving instruction in poultry husbandry this winter. Lectures are given by Messrs. H. W. Jackson, of Cambridge, Geo. D. Block, of Yellow Springs, O. E. Miles, of Columbus, Charles McClave, of New London, and Chas. E. Cram, of Carey, Ohio. Mr. S. T. Campbell, of Mansfield, a noted poultry judge and breeder of Minorcas, has charge of the laboratory work, which comes Saturday mornings. Mr. Campbell also gives some lectures. All of the above persons are noted poultry authorities.

The Department of Animal Husbandry is having many inquiries for Berkshire and Larke Yorkshire swine, letters being received from all over the United States. Berkshire boars have been shipped as far as South Dakota and Wyoming, while local shipments are being made to various parts of Ohio. The Department has published a pamphlet regarding the breeding of the University swine, which will be sent out on application. The University has sold to Julius Lindstedt, of the Upper Peninsula, Mich., a Large Yorkshire boar and sow.

Howard Gerlaugh and R. W. Cory were at the University on January 23.

THE TOBACCO TROUBLE IN SOUTHERN OHIO AND KENTUCKY—THE GROWERS' VICTORY

H. E. Tweed

The writer is frequently asked to give an outline of the "tobacco troubles" as they existed in this region. As is generally known, there has been much dissatisfaction among growers, they claiming unfair treatment at the hands of the American Tobacco Company. The latter is commonly referred to as "the trust," and includes various large factories which together use about 80 per cent. of the tobacco product of the contending farmers. Ever since the combination of the factories, especially in recent years, prices have been wholly unfair, the growers claim. It is also held that prices have been arbitrarily fixed, and that the law of supply and demand has been wholly disregarded.

Two years ago an organized effort to better conditions was launched through the American Society of Equity. Accordingly, about 60 per cent. of the total product of 1906 was pooled and held for stated prices. This was not taken by factories, and when another (1907) crop was ready for market it, too, was placed in the pool. Practically the whole of this crop was thus pledged and the two were now faithfully held by the producers. Contrary to the hopes of the organized growers, practically none of their tobacco had been sold at the close of the year 1907. It now became evident that to raise another crop in 1908, thus adding a large amount to that already on hands, would so increase the total as to practically preclude the success of the movement. Accordingly, contracts were made through the organization pledging "non-production" in 1908. This plan proved very popular, and, as we shall see later, led to success. It was a strange condition to see fields that would have ordin-

arily been planted in this beautiful "weed" either left vacant or planted to some other crop. The vast majority of the populace "beat their tobacco-knives into pan-cake turners," and turned temporarily away from their chosen vocation.

To these actions a minor part of the farmers did not accede, and those remaining outside of the organization became known as "independent" growers. These generally sold their 1906 and 1907 product to the trust at very remunerative prices and promptly began to prepare for another crop in 1908. The organized grower now claimed that his independent neighbor was by these acts defeating the purpose of the former's effort by "feeding the enemy." It was also very humiliating to the grower with two crops pooled and none growing in 1908 to see his independent neighbor receiving handsome prices for his product, which prices were made possible only by the loyal action of the former, and when it came to making preparation for another crop to be sold in the same way, it was simply beyond forbearance.

Soon the situation became strenuous, the independent grower maintaining his legal right to do as he pleased in the matter, and those in the organization contending that the former should join their ranks as opposed to a common enemy. The movement resolved itself into a veritable strike, in which the organized grower was the striker, the independent grower the strike-breaker, the factories representing the employer. Soon threats and depredations were committed against the independent grower. The faction having the dastardly work in hand became known as "night riders" from their

habit of going at night to do their work. It is enough to state that. It is alleged they murdered, burned the barns, destroyed the tobacco beds and shot up the residences of independent growers. The public is more or less familiar with these outrages, and we will relate but one incident that occurred on the farm of a neighbor.

Knowing the situation, this man placed his beds near the house, where they could be covered from an upper window. Late one night a band of riders entered the premises and proceeded to destroy his beds, whereupon he discharged the contents of a shotgun among them. Infuriated by this, the mob, which was armed to a man, poured a volley into the house, shattering windows, etc, thus greatly endangering the lives of the occupants. The sleeping children escaped injury by being in an upper story and away from outside walls, but as it was the beds in which they slumbered were literally covered with falling debris. Having accomplished their work of destruction, the marauders disappeared. Intimidated by this and various other outrages, the law-abiding population, whether affiliated with the organization or not, felt the necessity of protection. Accordingly, state troops were promptly furnished both in Ohio and Kentucky. These by an impressive presence and a few weeks of efficient guarding and scouting succeeded in restoring a condition of quietude and safety.

These were dark days for all concerned. Occasional reports of pending sales would be hailed with delight only to result in despair at lack of confirmation. Would the situation drag thus until the advent of 1909 when it would be time to prepare for another crop? Then more rumors of negotiations at headquarters reached the disheartened farmers. This time the accounts seemed

more encouraging with a better foundation, and about the middle of November the great news—Sold!—flashed over the wires, bringing gladness without parallel to thousands and thousands of homes throughout the tobacco belt and telling the millions that the farmers had won in this great fight. Never again will these men accede to the merciless demands of this giant octopus. Aside from this they have shown the possibility of successful organization, thus setting an example that will be of untold benefit wherever organization is attempted.

INSECTS AND FRUIT GROWING

(Continued from page 20.)

It is a very difficult matter to estimate the amount of loss chargeable to these various insects. Those affecting the health and vigor of the tree itself lessen the productiveness at least 17 per cent. Various estimates of the loss due to the insect enemies of the fruit have been made, and in general it is believed that roughly the loss is from one-fourth to one-half of the entire apple crop of the United States every year. But along with all these insects and diseases has come a remedy for each. In fact, there are nearly as many insecticides known and used as there are insects on which to use them. New and improved methods of spraying have been adopted by all up-to-date fruit growers. With these many weapons and improved methods it is possible for the orchardist to grow enormous crops of fruit in spite of all these enemies which attack him in his work.

Coming to our own times, fruit raising is just as successful in California, Italy and Spain today as it was before the growth of commerce introduced into each of these countries many new insects. Not one of us, also, can recall a time when he suffered for the lack of the

necessaries or the luxuries of life on account of insects. We have the San Jose scale, the Hessian fly, the imported cabbage worm and fifty other pests from abroad. We have such important native pests as the Colorado potato beetle and the chinch bug, yet the production of crops particularly affected with these insects proceeds with little apparent check therefrom.

Occasionally an individual will suffer severely, but as a rule it will be found that it is a result of his own neglect or ignorance, and whenever there has been an absence or scarcity in any particular vegetable, fruit or other product of the soil, the cause as a rule has not been the insect enemies but some other adverse condition much more universal and fundamental.

Prof. Arthur G. McCall has gotten out a text on "The Physical Properties of Soils." It consists of an illustrated laboratory guide. It contains eighteen experiments and covers the ground very thoroughly and clearly. A glance through the little book will leave no doubt in your mind as to its value.

He who gives us better homes, better books, better tools—a fairer outlook and a wider hope—him will we crown with laurel.—*Emerson*.

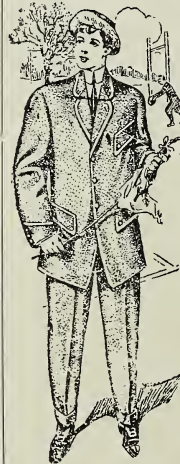
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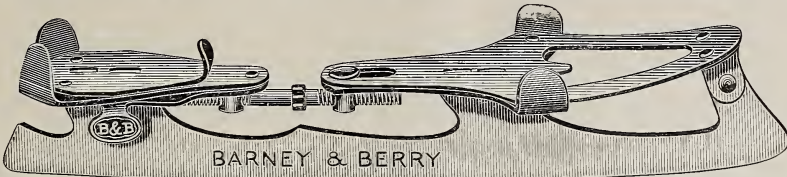
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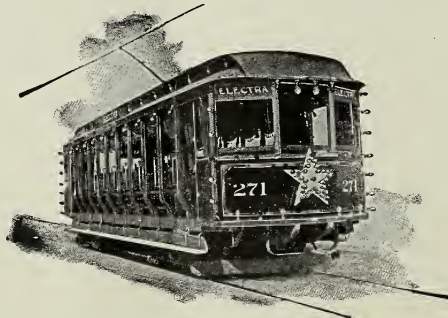
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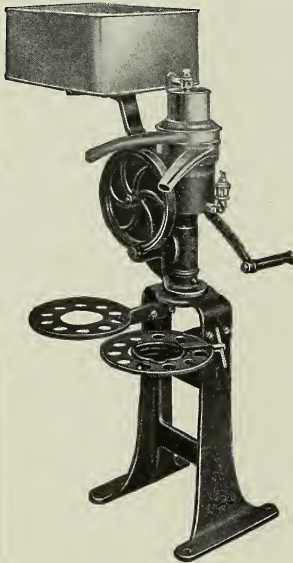
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